Abstract Submitted
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Effect of acetylene portion on the properties of high frequency discharge in argon[1] IRINA SCHWEIGERT, DMITRY ARISKIN, Institute of Theoretical and Applied Mechanics, Russian Academy of Sciences, INSTITUTE OF THEORETICAL AND APPLIED MECHANICS, RUSSIAN ACADEMY OF SCIENCES TEAM — The gas discharge in hydrocarbon mixtures is widely used for carbon film growth. These thin films are of great interest for a wide range of industrial applications due to their extraordinary material properties. Noble gases like argon and neon are often used as main background gases for hydrocarbon mixtures as their presence changes morphology of diamond like carbon films and leads to fewer crystalline defects. In this paper the numerical study of characteristics of high frequency discharge are performed with using PIC-MCC simulation for different portions of acetylene in the mixture with argon. We consider the formation of heavy ions and radicals which are precursors for nanoparticle growth in the discharge volume. The density of electrons, positive and negative ions are found to be non-monotonic functions of the quantity of the acetylene in the mixture. The presence of the negative ions, the density of which is comparable with electron density, weakly affects the parameters of discharge.

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